# OIT Chemical Industry Team Overview

*Effectively managing research, development, deployment and commercialization in partnership with industry, national laboratories, academia and other organizations*

***OIT Chemical Industry Team Goals:***

- Facilitate the roadmapping and implementation of the chemical industry's vision
- Identify high risk technologies that are industry priorities and match OIT's mission
- Partner with industry to develop and fund a coherent R&D program
- Develop appropriate interfaces with stakeholders
- Communicate efforts and successes
- Facilitate and leverage resources

***OIT Chemical Industry Team Projects Must:***

- Improve energy efficiency
- Align with the industry vision
- Prevent pollution and/or reduce waste
- Provide adequate return on investment

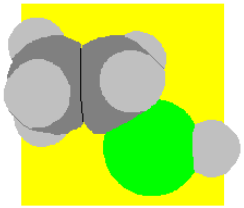
# The OIT Chemical Industry Team Has Active Projects in All States

***Each New $1 Million Federal Investment in the Chemical Industry is Expected to Provide:***

- GDP increase of $2.43 million
- 140 new jobs
- $4 million in energy savings

***The Chemical Industry is Vital to the Prosperity of the U.S.; as the Industry:***

- Employs more people than reside in Delaware
- Pays wages 31% above the manufacturing average
- Accounts for about 2% of U.S. GDP
- Accounts for 10% of manufacturing shipments
- Is the largest exporting industry in the U.S.
- Maintains a trade surplus of $20 billion (1995)
- Uses 25% of manufacturing energy
- Creates 7 tons of waste annually for each citizen



# OIT Chemical Industry Team

OFFICE OF INDUSTRIAL TECHNOLOGIES
Productivity through Technology

***Partnering With The U.S. Chemical Industry To Maximize Economic, Energy, And Environmental Benefits Through Research And Development Of Innovative Technologies***

Department of Energy
Office of Industrial Technologies

Contact: Bruce Cranford
EE-20 5F-043
1000 Independence Ave. SW
Washington, DC 20585
(202) 586-9496
BRUCE.CRANFORD@HQ.DOE.GOV
http://www.oit.doe.gov/IOF/chemicals

# Research and Development Activities

**Chemical Synthesis**

- Develop new capabilities for improved chemical synthesis through the use of ***novel reactor designs*** and ***alternative feedstocks*** from corn and wood sources

**Bioprocesses and Biotechnology**

- Develop methods to allow a prominent role for biotechnology in chemical operations through ***improved enzyme catalysts*** and ***advanced bioreactors***

**Materials Technology**

- Develop high performance, low cost materials from natural sources, such as ***biosynthesis of long-chain dicarboxylic monomers from renewable feedstocks***

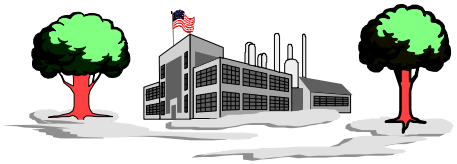
**Process Science and Engineering Technology**

- Develop new processes that minimize environmental impact and waste, such as ***flexible chemical processing of post-consumer polymers*** and ***recovering chlorosilane intermediates during silicon production***

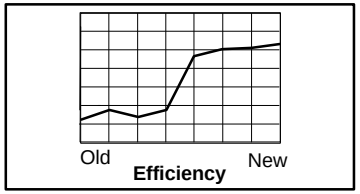
**Computational Technologies**

- Develop tools and methods to optimize chemical operations including ***separations technology tool for clean process advisory system*** and ***pollution assessment and prevention software***

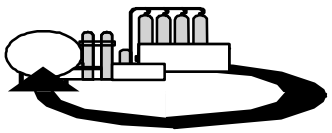
# Scale-up and Deployment Activities

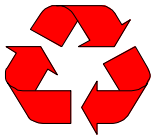


Develop more productive technology and demonstrate efficiency improvements through larger-scale designs and industrial host site demonstrations, including ***inorganic polymer membranes, advanced electrodialysis and pervaporation for separations and pollution prevention*** and ***production of lactic acid from renewable resources***




Develop end-use markets and demonstrate economics for recycled materials, such as ***polyurethane shoe soles from scrap tires, prompt non-tire rubber recycling*** and ***plastics from auto shredder residue***





# OIT Successes

**Industrial Commercialization**

- Reversible chemical association separation technology
- Reverse osmosis/ultrafiltration technology for reclaiming/reusing waste water
- Recovery process for contaminated methanol
- Ultrasonic tank cleaning technology
- Dual cure photocatalyst coatings
- Supercritical carbon dioxide cleaning

**Industrial Partners/Participants** (partial list)

- AlliedSignal
- American Institute of Chemical Engineers/ Center for Waste Reduction Technologies
- Applied CarboChemicals
- Composite Particles
- Cooper Tire & Rubber
- Dow Chemical
- Dow Corning
- Eastman Chemical
- General Electric
- Mineral Technologies, Inc.
- National Corn Growers Association
- Union Carbide

**Highlights**

- Full-scale demonstration of novel ethanol fermenter
- Pilot-scale demonstration of closed furnace, direct current silicon production technology
- Full-scale demonstration of membrane vapor recovery technology
- Bioprocessing research led to creation of 6 companies

**12/96**